

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Controlling methicillin-resistant Staphylococcus aureus (MRSA) in a hospital and the role of hydrogen peroxide decontamination: an interrupted time series analysis
<b>AUTHORS</b>	Mitchell, Brett; Digney, Wilhelmine; Locket, Phil; Dancer, Stephanie

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Ferreira AM Federal University of Mato Grosso do Sul - Brazil
<b>REVIEW RETURNED</b>	27-Dec-2013

- The reviewer completed the checklist but made no further comments.

<b>REVIEWER</b>	Vincent CC Cheng Infection Control Officer, Queen Mary Hospital Consultant, Department of Microbiology, Queen Mary Hospital Honorary Associate Professor, Department of Microbiology, The University of Hong Kong
<b>REVIEW RETURNED</b>	24-Mar-2014

<b>GENERAL COMMENTS</b>	<p>The authors assessed the role of hydrogen peroxide (in either vapour or cloth form) decontamination in reducing the residual environmental MRSA after MRSA-positive patient's discharge from either single room or shared room. In addition, authors also monitored the rate of MRSA bacteremia, nosocomial acquisition of MRSA colonization and infection throughout the study period.</p> <p>This study has involved over 3600 patient's discharge clean and over 32,000 environmental swabs, with a trained hospital cleaning team, and using the same group of persons to collect environmental swab throughout the study. However, the screening criteria of MRSA (introducing weekly MRSA screening since Jan 2010 in addition to targeted screening) and the laboratory diagnostic method for MRSA were changed during the study period.</p> <p>It is interesting to note that while there was no significant reduction in residual environmental MRSA after termination cleaning with hydrogen peroxide using interrupted time series analysis, but there was a significant reduction of MRSA colonization and infection after the intervention. The authors addressed a lot of potential confounders including feedback to cleaning staff, quicker laboratory methods and patient's isolation. However, reduction in fluoroquinolone consumption was an even more important confounder.</p> <p>Major concern:</p>
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	<p>Given a lot of potential confounders, it seems that the contribution of hydrogen peroxide intervention is not clear, especially after using interrupted time series analysis. The cost of hydrogen peroxide is more expensive than the usual detergent. It is important to mention the cost of environmental disinfection (before and after intervention) in this study so that the readers can judge if it is cost-effective to follow the protocol illustrated by the authors.</p> <p>Minor comment:</p> <p>Change the term from “healthcare-acquired” MRSA to “hospital-acquired” MRSA</p> <p>Dividing the culture plates into quarters to enable several swabs to be cultured may result in reduction in detection sensitivity and may introduce human error in reading culture results. Please address this point.</p> <p>Is the time series analysis also calculated in SPSS? If not, please specify the statistic software.</p> <p>The hand hygiene and antibiotic consumption data should be put under RESULTS instead of DISCUSSION.</p> <p>In Table 1, what is (are) the reasons for the significant difference of certain parameters such as bed and mattress but not the others?</p> <p>For Figure 1 and 2, please show the trend change and level change before and after intervention. It is better to use a dotted line to show the trend as well.</p> <p>Is ethic approval is needed in this study according to the prevailing policy of the research institute of the authors?</p>
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<b>REVIEWER</b>	wendy beckingham Canberra Hospital Canberra Australia
<b>REVIEW RETURNED</b>	27-Mar-2014

<b>GENERAL COMMENTS</b>	<p>noted line 9 and 10 a word is missing which diminishes the clarity of the statement can this corrected before publication</p> <p>this manuscript is well written it adds to a much needed body of research. It is extremely topical and helps raise the importance of cleaning in health care.</p>
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## VERSION 1 – AUTHOR RESPONSE

Reviewer: Ferreira AM

No comments were made.

Reviewer: Vincent CC Cheng

We would like to thank Vincent for raising some important points. They have added value to this paper. We have sought to address the points raised.

The cost of hydrogen peroxide is more expensive than the usual detergent. It is important to mention the cost of environmental disinfection (before and after intervention) in this study so that the readers can judge if it is cost-effective to follow the protocol illustrated by the authors

- We agree that cost is an important element, however robust costing data was unfortunately not available to perform any cost effectiveness analysis. We have made additional comment to this effect and a recommendation for this to be considered. A new paragraph addressing this has been added to the end of the strength and weakness section of the manuscript.

Change the term from “healthcare-acquired” MRSA to “hospital-acquired” MRSA.

- Agree. Changed as requested throughout the manuscript.

Dividing the culture plates into quarters to enable several swabs to be cultured may result in reduction in detection sensitivity and may introduce human error in reading culture results. Please address this point.

- Agree. Several points addressing this further have been added to the methods, ‘microbiology laboratory methods’ section.

Is the time series analysis also calculated in SPSS? If not, please specify the statistic software.

- Yes. Data analysis amended to make this clear (p.8).

The hand hygiene and antibiotic consumption data should be put under RESULTS instead of DISCUSSION.

- We have considered this point and whilst acknowledging the point made, we do not agree these data should be moved to the results. We believe the results should describe the results as related to the intervention and have set out our paper according to the SQUIRE checklist. Hand hygiene and antibiotic consumption are potential confounders/bias, and therefore we think these should be addressed in the discussion.

In Table 1, what is (are) the reasons for the significant difference of certain parameters such as bed and mattress but not the others?

- We agree this is interesting, but we are unable to explain this difference and unfortunately do not have data to support any speculative comments. Given this, we would prefer not to comment in the paper. Out of interest, we believe the proximity of the VP machine may be one reason, but as this was not measured, we don't wish to comment on this in the paper.

For Figure 1 and 2, please show the trend change and level change before and after intervention. It is better to use a dotted line to show the trend as well.

- Trend changes are useful visually, and we have included this to in Figure 1 and 2 to show the overall trend. Trends for each intervention are potentially inappropriate to superimpose in a time series analysis where there is a lag effect, so have not done this.

Is ethic approval is needed in this study according to the prevailing policy of the research institute of the authors?

- Yes. Details regarding ethics are provided at the end of the manuscript.

Reviewer: Wendy Beckingham

We thank Wendy for the supportive comments made in relation to this paper.

Noted line 9 and 10 a word is missing which diminishes the clarity of the statement can this corrected before publication

- Agree. Amended.

Editorial

No changes were requested

-We have made some very minor grammatical changes to improve the language in certain parts.